$$y = x^2\sqrt{9-x^2} = x^2(9-x^2)^{\frac{1}{2}}$$

$$\frac{dy}{dx} = x^2 \cdot \frac{1}{2}(9-x^2)^{-\frac{1}{2}} \cdot (-2x) + (9-x^2)^{\frac{1}{2}} \cdot 2x$$

$$\frac{dy}{dx} = \frac{-x^3}{\sqrt{9-x^2}} + \frac{2x\sqrt{9-x^2}}{\sqrt{9-x^2}} \cdot \sqrt{9-x^2}$$

$$\frac{dy}{dx} = \frac{-x^3 + 2x(9-x^2)}{\sqrt{9-x^2}} = \frac{-x^3 + 18x - 2x^3}{\sqrt{9-x^2}}$$

$$\frac{dy}{dx} = \frac{-3x^3 + 18x}{\sqrt{9-x^2}} \quad \frac{+}{+}$$

f' $u^+ 0^- 0^+ 0^- u$

x $-3 \quad -\sqrt{6} \quad 0 \quad \sqrt{6} \quad 3$

$x^2 4$
-36

Inc. $(-3, -\sqrt{6})$
$(0, \sqrt{6})$

Dec. $(-\sqrt{6}, 0)$
$(\sqrt{6}, 3)$

$-3x^3 + 18x = 0$

$-3x(x^2 - 6) = 0$

$x = 0$

$x = -\sqrt{6}$ Max
$x = 0$ Min
$x = \sqrt{6}$ Max

$$\frac{dy}{dx} = \frac{-3x^3+18x}{\sqrt{9-x^2}}$$

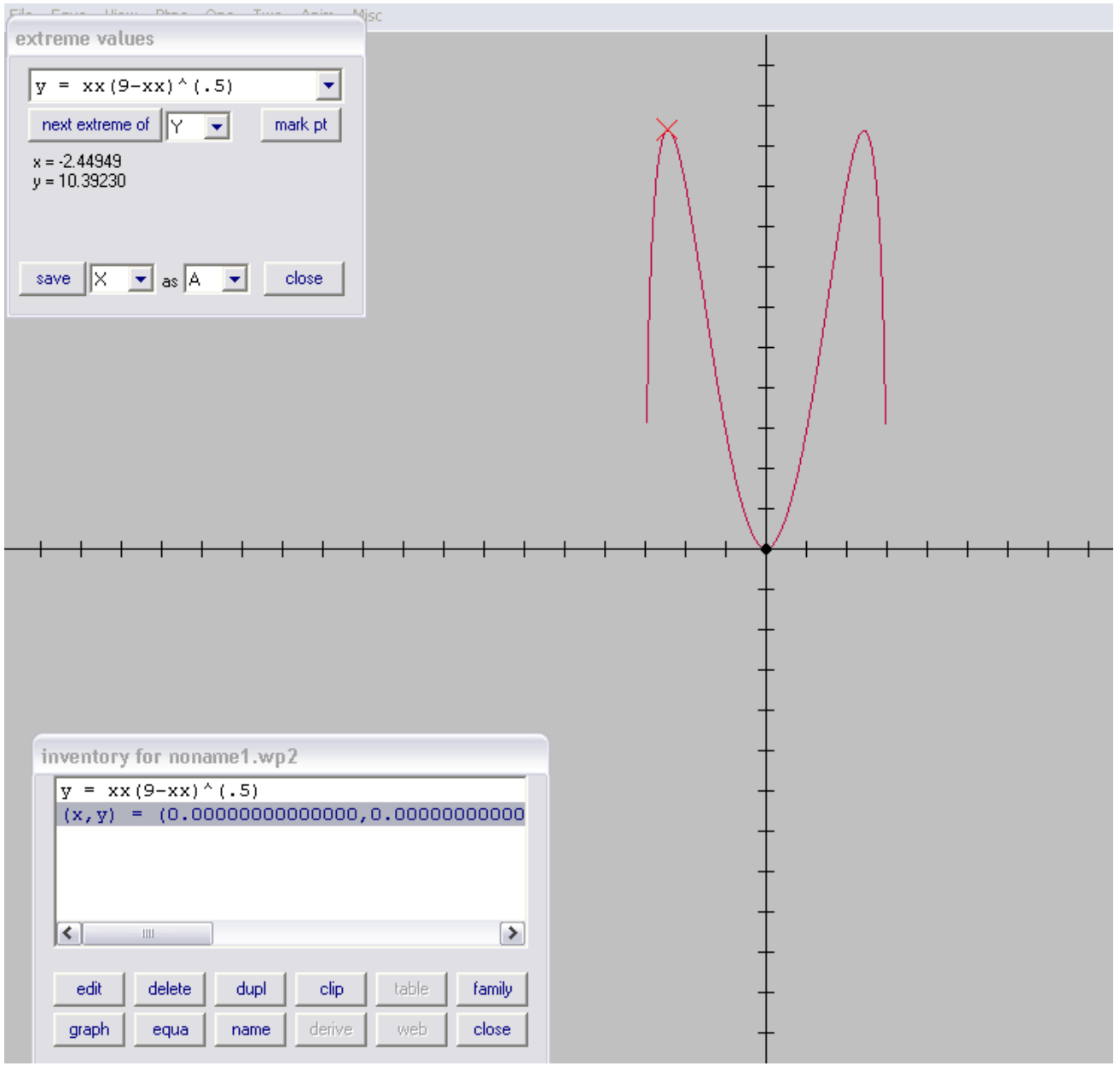
$$y'' = \frac{\sqrt{9-x^2}\cdot(-9x^2+18) - (-3x^3+18x)\cdot\frac{1}{2}(9-x^2)^{-\frac{1}{2}}\cdot(-2x)}{9-x^2}$$

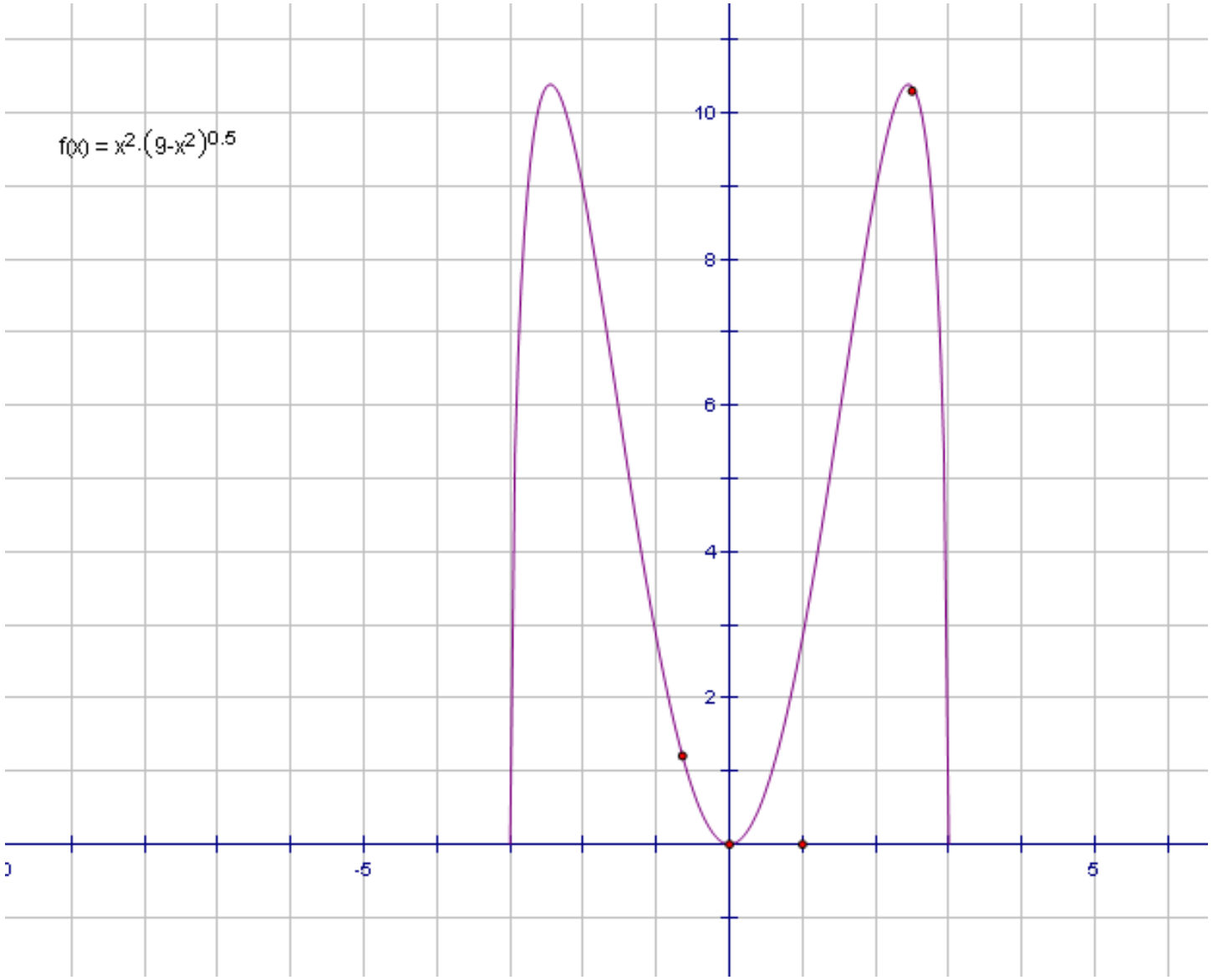
$$y'' = \frac{\sqrt{9-x^2}(-9x^2+18) + \frac{x(-3x^3+18x)}{\sqrt{9-x^2}}}{9-x^2}$$

$$y'' = \frac{(9-x^2)(-9x^2+18) + (-3x^4+18x^2)}{\sqrt{9-x^2}(9-x^2)}$$

$$y'' = \frac{-81x^2+162+9x^4-18x^2+3x^4+18x^2}{\sqrt{9-x^2}(9-x^2)}$$

$$y'' \quad \frac{6x^4-81x^2+162}{\sqrt{9-x^2}(9-x^2)}$$


extreme values
y = xx(9-xx)^(.5)
next extreme of
Y
mark pt
x = -2.44949
y = 10.39230
save
X
as
A
close
inventory for noname1.wp2
y = xx(9-xx)^(.5)
(x,y) = (0.00000000000000,0.00000000000
edit
delete
dupl
clip
table
family
graph
equa
name
derive
web
close



Title: Feb 11-11:48 AM (4 of 7)

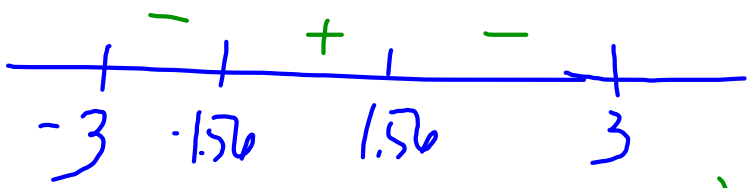
$$x^2 - 6 = 0$$

$$x^2 = 6$$

$$x = \pm\sqrt{6}$$

$$y'' \quad \frac{6x^4 - 81x^2 + 162}{\sqrt{9-x^2}\,(9-x^2)}$$

$$y'' = \frac{3(2x^4 - 27x^2 + 54)}{\sqrt{9-x^2}\,(9-x^2)}$$



Concave down → $(-3, -1.56)$ $(1.56, 3)$

Concave up → $(-1.56, 1.56)$

Pts of Infl. $x = \pm 1.56$

$$y = \frac{x}{x^3 - 1}$$

$$y' = \frac{(x^3 - 1)\cdot 1 - x(3x^2)}{(x^3 - 1)^2}$$

$$y' = \frac{x^3 - 1 - 3x^3}{(x^3 - 1)^2}$$

$$y' = \frac{-2x^3 - 1}{(x^3 - 1)^2}$$

$-2x^3 - 1 = 0$

$-2x^3 = 1$

$x^3 = -\frac{1}{2}$

$x = \sqrt[3]{-\frac{1}{2}}$